U.S. Department of Transportation
National Highway Traffic Safety Administration

TRAFFIC TECH
Technology Transfer Series

NHTSA

DOT HS 812 489

March 2018

National Traffic Speeds Survey III: 2015

Vehicle speeds are an important factor in traffic safety. NHTSA's most recent data estimates that approximately 27 percent of all fatal motor vehicle crashes are speeding-related (NCSA, 2018). NHTSA estimated the economic cost of speeding-related crashes to be $52 billion in 2010 (Blincoe et al., 2015). This is the third of three field surveys NHTSA has funded in response to this pervasive traffic safety problem. The surveys measured driving speeds for all types of motor vehicles on freeways, arterial highways, and collector roads across the United States and produced national and regional estimates of traffic speeds for various types of roads and vehicles, tracking these speed measurements over time.

The speed surveys were designed as geographic cluster samples of primary sampling units (PSUs). PSUs can be a city, county, or group of two or three counties. PSUs were chosen to represent a range of combinations of regions of the United States, level of urbanization, and type of topography (flat, hilly, mountainous). Speeds were acquired from randomly drawn road segments on limited access highways, major and minor arterial roads, and collector roads (FHWA, 2013). Speed measurement sites were selected in road segments with various degrees of straight, curved, flat, and hilly geometry. Thirty sites in each of 24 PSUs were selected, for a total of approximately 720 collection sites.

Speed data was collected during summer 2015. The previous survey was in spring 2009. Speeds on major and minor arterials were measured using small, self-contained, on-road sensors temporarily placed on the road surface at each site for a single 24-hour period. Side-fire radar devices were deployed on the limited access highways to enhance safety and efficiency in data collection. "Free-flow" was defined as vehicle headway of greater than 5 seconds, indicating vehicles with fewer constraints on speed choice due to the proximity of other vehicles. As in 2009, the mean, 85th percentile, and other measures of traffic speeds and speed variation for free-flow traffic did not differ by more than 1.5 mph in 2015, compared to all traffic.

Average Speeds by Road Type

Overall, there was virtually no difference between 2009 and 2015 speeds measured on limited access roads. In contrast, the major arterials had an increase in mean speed of 3.1 mph from 2009 to 2015 with increases of 5.6 mph for the 85th percentile and 6.1 mph for the 95th percentile. Similarly, minor arterial/collector roads had a mean increase of 2.7 mph in the same period, with the 85th and 95th percentiles increasing 5.4 and 6.6 mph, respectively (see Table 1). Interestingly, there was a greater variation between speeds on these roadways as evidenced by the increase in the standard deviation from 10 to 13 mph over the two measurement periods.

While there were no appreciable differences in speeds on limited access roads for most vehicles from 2009 to 2015, mean speeds for the largest trucks (80 to 100 ft.) increased by 2.5 mph. During the same period, passenger vehicles had mean speed increases of 3 to 4 mph on major arterials, while medium and large trucks showed no increase and the largest trucks decreased by 1 mph. On minor arterials and collectors, mean speeds of passenger vehicles increased 2 to 3 mph and medium trucks increased 1 to 2 mph, while large trucks mean speeds decreased by 2 mph.

Table 1: Overall Speed Estimates (mph) by Road Class (Free-Flow) by Year

	Speed Estimate		
FCC ROAD CLASS	**2009**	**2015**	**Change**
Limited access			
Mean	70.50	70.38	- 0.12
Median	70.84	70.82	- 0.02
85th percentile	77.96	78.06	0.11
95th percentile	81.83	82.21	0.38
Major arterial			
Mean	53.28	56.41	3.12
Median	53.37	57.34	3.97
85th percentile	63.68	69.27	5.58
95th percentile	70.14	76.22	6.08
Minor arterial			
Mean	47.01	49.73	2.72
Median	46.15	49.04	2.89
85th percentile	57.82	63.23	5.41
95th percentile	65.56	72.14	6.58

Exceeding the Speed Limit

Most traffic exceeded the speed limits in both 2009 and 2015 (see Table 2). While the percentage of vehicles traveling over the speed limit on limited access roads by any amount in 2015 (70.1%) decreased from 2009, the percentage of vehicles traveling greater than 10 mph over the speed limit (20.3%) increased slightly. On major arterials, there was a small increase in speeding by any amount in 2015, with 18.1 percent traveling greater than 10 mph over the speed limit, an increase of 4.9 percent over 2009. On minor arterials and collectors, there was also a small increase in speeding by any amount in 2015, with 18.6 percent traveling greater than 10 mph over the speed limit, an increase of 3.6 percent over 2009.

Table 2: Percentage of Vehicles Exceeding the Speed Limit By mph Over Limit and Year

	Percentage of Vehicles		
FCC ROAD CLASS	**2009**	**2015**	**Change**
Limited access			
By Any Amount	71.7%	70.1%	- 1.6%
By > 5 mph	45.5%	44.9%	- 0.6%
By > 10 mph	20.1%	20.3%	0.2%
Major arterial			
By Any Amount	55.9%	58.7%	2.8%
By > 5 mph	31.0%	36.2%	5.2%
By > 10 mph	13.3%	18.1%	4.9%
Minor arterial			
By Any Amount	59.1%	60.3%	1.2%
By > 5 mph	33.2%	36.7%	3.4%
By > 10 mph	15.0%	18.6%	3.6%

Urban Versus Rural Speeds

Overall, in 2015 speeds in urban areas were lower than in suburban and rural areas for all road types. Major arterials and minor arterials/collectors in rural areas were 15 to 17 mph faster than their counterparts in urban areas. For major arterials, mean speeds decreased by 4 mph on urban roads and by 1 mph on urban/suburban roads from 2009 to 2015, but increased by 5 mph on suburban roads and 4 mph on rural roads (see Table 3). Minor arterials/collectors showed a similar trend from 2009 to 2015. Urban roads had a decrease of 1 mph and urban/suburban roads a 5 mph decrease in mean speeds during this period, while rural road mean speeds increased by 4 mph, with suburban roads showing no change.

Speeds by Day of Week

Mean speeds on limited access roads varied by only 2 mph across days of the week in 2015, with Tuesdays as the slowest (69 mph) and Fridays to Sundays being the fastest (71 mph). From 2009 to 2015, mean speeds increased by 3 mph on Mondays and Wednesdays and decreased by 1 mph on Fridays to Sundays. Mean speeds on major arterials in 2015 showed increases for every day of the week except Sundays (down by 1 mph), with the biggest increase from 2009 to 2015 occurring on Thursdays (by 7 mph) and Mondays (by 5 mph). For minor arterials/collectors, mean speeds increased for all days of the week except Saturdays, which saw no change. The biggest increase in mean speeds on these roads was on Fridays (by 6 mph) which had the highest mean speeds (53 mph) and range of speeds for this type of road. Time of day and light conditions had little effect on traffic speeds in either 2009 or 2015.

Table 3: Speed Estimates (mph) by Urbanicity for Major Arterials And Minor Arterial/Collectors

	FCC ROAD CLASS			
	Major Arterials		Minor Arterials/Collectors	
	2009	2015	2009	2015
Urban				
Mean	47.34	43.8	39.82	38.71
Median	46.85	42.97	39.65	37.99
85th percentile	53.65	52.5	47.2	46.55
95th percentile	58.94	63.19	52.68	53.22
Urban/suburban				
Mean	54.65	53.69	47.83	42.57
Median	54.35	53.23	47.24	42.5
85th percentile	63.85	63.42	58.3	51.91
95th percentile	70.09	76.29	65.77	59.38
Suburban				
Mean	47.48	52.87	44.53	44.63
Median	47.21	52.26	43.55	43.78
85th percentile	58.84	67.58	54.26	55.24
95th percentile	66.1	75.08	61	63.38
Rural				
Mean	54.79	59.16	51.89	55.93
Median	55.74	59.95	52.25	56.11
85th percentile	65.95	70.32	63.97	67.94
95th percentile	72.18	76.95	70.23	75.77

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How to Order

To order *Survey of National Travel Speeds III: 2015*, prepared by Westat, Inc., write to the Office of Behavioral Safety Research, NHTSA, NTI-130, 1200 New Jersey Avenue SE., Washington, DC 20590, fax 202-366-7394, or download from www.nhtsa.gov. Randolph Atkins, Ph.D., was the manager for this project.

Suggested APA format citation for this document:

National Highway Traffic Safety Administration. (2018, March). *National Traffic Speeds Survey III: 2015* (Traffic Tech, Technology Transfer Series, Report No. DOT HS 812 489). Washington, DC: Author.

U.S. Department of Transportation

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1200 New Jersey Avenue SE., NPD-310
Washington, DC 20590

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